CHROMOSOME COUNTS IN ERIOPHYLLUM AND OTHER HELENIEAE (COMPOSITAE)

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This paper presents chromosome counts obtained during long term investigations of species complexes in *Eriophyllum* and *Chaenactis*. Methods and the disposition of voucher specimens have been described previously (Mooring, 1966). I appreciate support afforded by the National Science Foundation and the comments of John Strother. Counts for *Eriophyllum lanatum* var. *obovatum, Chaenactis alpigena* and *Orochaenactis thysanocarpha* are first reports, and those for all taxa but *E.* lanatum var. *integrifolium* ($2n = 16$ II), *E. confertiflorum* var. *tanacetiflorum, E. latilobum, Chaenactis suffrutescens* and *Pseudobahia heermannii* are new chromosome numbers for these taxa (Table 1). The counts for the latter 5 taxa are second or third reports.

My data for *Eriophyllum lanatum, E. confertiflorum,* and *E. latilobum* agree with and supplement those of Carlquist (1956) and Mooring (1966), but those for two other species of *Eriophyllum* differ. Carlquist reported $n = 16$ for *E. jepsonii,* whereas I found that $n =$ ca 32 to 42. My 11 counts come from 4 of the 5 known stations of this comparatively rare species, including a transect through the Arroyo del Puerto locality in which Carlquist obtained his material. Some individuals had the equivalent of 32 to 34 II, others probably had additional chromosomes. Meiotic irregularities and the absence of anaphase and telophase stages prevented more exact determination. Constance (1937) and Munz (1959) observed that *E. jepsonii* is in many ways intermediate between *E. lanatum* and *E. confertiflorum,* and Munz suggested a possible origin by interspecific hybridization. The meiotic irregularities may therefore reflect a hybrid derivation, the effects of polyploidy, or both. The biology of this species and its relationship to other species continue to be studied. In contrast to *E. jepsonii,* the 13 samples of *E. staechadifolium* furnished excellent meiotic cells, all of which showed 15 II, whereas Carlquist (1956) reported 16 II. John Strother also determined $n = 15$ for this species (Red Rock Island, Contra Costa Co., *Ferlatte and Moe 1251,* UC). This study continues, as the populations sampled did not include any visited by Carlquist.

The counts of 6 II for the relatively infrequently encountered *Chaenactis alpigena* and *C. suffrutescens* conform to the pattern of $n = 6$ in strongly perennial species of this genus (Raven and Kyhos, 1961; Mooring, 1965). Curiously, many of the *C. suffrutescens* fruits were empty, and germination of apparently viable ones, when tested in the garden, was a fraction of one per cent. The count of 9 II for the monotypic *Orochaenactis* was no surprise. Despite its generic name and

Table 1. Chromosome Counts

Collection numbers are my own. Numbers in parentheses indicate number of individuals counted, if more than one. Locations are approximate.

Eriophyllum lanatum (Pursh) Forbes
var. *arachnoideum* (Fisch. & Avé-Lall.) Jepson. $2n = 16$ II. California Sonoma Co., Jenner, *2223.* $2n = 24$ II. California. Sonoma Co., Santa Rosa, *1907.*
var. *croceum* (Greene) Jepson. $2n = 8$ II (3). California. Tulare Co., Mineral King, *2237.*
var. *cuneatum* (Kell.) Jepson. $2n = 8$ II (3). California. Plumas Co., Quincy, *2027.*
var. *grandiflorum* (Gray) Jepson. $2n = 32$ II. California. Tehama Co., Paskenta, *2054.*
var. *integrifolium* (Hook.) Smiley. $2n = 16$ II (2). Idaho. Gem Co., Emmett, *2129.* $2n = 24$ II (2). Washington. Yakima Co., Satus Pass, *1612.* $2n = 32$ II or ca. 32 II (3). Oregon. Wasco Co., The Dalles, *1620.*
var. *lanceolatum* (Howell) Jepson. $2n = 16$ II. California. Siskiyou Co., Somesbar, *2947.*
var. *leucophyllum* (DC.) W. R. Carter. $2n = 8$ II. Washington. Kittitas Co., Cle Elum, *1597.*
var. *obovatum* (Greene) Hall. $2n = 8$ II (4). California. Kern Co., Alta Sierra, *2236,* and San Bernardino Co., Running Springs, *2524.*
Eriophyllum confertiflorum (DC.) Gray. $2n = 24$ II. California. Mariposa Co., Bagby, *2346.*
var. *tanacetiflorum* (Greene) Jepson. $2n = 32$–34 II (3). California. Mariposa Co., Bagby-Coulterville, *2013, 2016.*
Eriophyllum jepsonii Greene. $2n = 32$–42 II (11). California, Alameda Co., Arroyo Mocho, *2436.* Contra Costa Co., Mitchell Creek Canyon, *2331.* San Benito Co., Antelope Fire Station, *2229,* and Emmett, *2371.* Stanislaus Co., Arroyo del Puerto, *2000, 2176, 2193, 2194, 2402.*
Eriophyllum latilobum Rydberg. $2n = 16$ II (5). California. San Mateo Co., Hillsborough, *1961.*
Eriophyllum staechadifolium Lagasca. $2n = 15$ II (13). California. Humboldt Co., Rockport, *2501.* Marin Co., Marshall, *2221.* Mendocino Co., Elk, *2503.* Monterey Co., Carmel Highlands, *2881,* and Point Sur, *2883.* San Mateo Co., Half Moon Bay. Santa Cruz Co., Davenport, *2884.*
Chaenactis alpigena C. W. Sharsmith. $2n = 6$ II (3). California. Alpine Co., Round Top Lake, *3008.*
Chaenactis suffrutescens Gray. $2n = 6$ II. California. Trinity Co., Coffee Creek Ranger Station, *1721.*
Orochaenactis thysanocarpha (Gray) Cov. $2n = 9$ II. California. Tulare Co., Quaking Aspen, *2530.*
Pseudobahia heermannii (Dur.) Rydberg. $2n = 3$ II. California. Mariposa Co., Bootjack, *2010.*

placement in the Helenieae the species does not resemble any *Chaenactis* in external morphology, pollen character, or chromosome number. The count of 3 II for *Pseudobahia heermannii* agrees with previous ones from the same geographic area by Carlquist (1956), whereas Strother (1972) reported 4 II from a Tulare Co. population. Carlquist (1956) reported counts of $n = 4$ from *P. bahiaefolia* however, and Munz (1959) observed that these species are "possibly insufficiently distinct". Further study of both might prove interesting.

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NEW RECORDS OF MYXOMYCETES FROM CALIFORNIA V.

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To date, 222 species of slime molds have been reported from California (Kowalski, 1970a; 1970b; 1972; Kowalski and Curtis, 1970). In this paper nine new records are discussed, bringing the total to 231. Thus, over 50% of the known species of slime molds (Martin and Alexopoulos, 1969) have been found in California. This seemingly high percentage is due to two factors: 1) California contains many varied habitats and thus species from different ecological niches and 2) Myxomycetes are generally cosmopolitan in distribution.

All collections listed have been deposited in the Herbarium of the University of California (UC). Nomenclature follows Martin and Alexopoulos (1969). Collection numbers are my own. This investigation was supported by the National Science Foundation grant GB-28653.

Liceaceae

Licea castanea G. Lister. Inner surface of decaying bark, Pine Creek Ranch, 24 miles north of Chico, Butte Co., *10963,* Dec. 12, 1969, *10981* and *10984,* Jan. 9, 1970; dead wood, Lower Bidwell Park, Chico, Butte Co., *3872,* March 27, 1965; decayed bork, Woodson Bridge State Park, Tehama Co., *9656,* April 29, 1967. In each of the above collections the substrate upon which *L. castanea* was growing was originally collected because it had another, larger myxomycetous species upon it. The minute sporangia of *L. castanea* were discovered later in the laboratory while the substrate was being scanned with a stereoscopic microscope. There